Final

Regional Forest Stewardship Standard
for the
Lake States-Central Hardwoods Region (USA)

Version LS Final

Lake States Working Group
of the
Forest Stewardship Council – US

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Introduction

The Lake States-Central Hardwoods Regional Certification Standards were developed by the Lake States Working Group, a chamber-balanced committee authorized by the Forest Stewardship Council-U.S. (FSC-U.S., National Initiative). Several years ago FSC-U.S. organized working groups in nine biogeographic regions of the contiguous 48 states and charged them with developing regional standards specifying additional, regionally appropriate requirements for responsible forestry to augment the more general Forest Stewardship Council (FSC) Principles and Criteria. Regional working groups developed drafts of the nine regional standards and submitted them to FSC-U.S. in 1999.

While each set of draft regional standards demonstrated good critical thinking, technical knowledge, and understanding of regional issues that are important to sustainable forestry, the draft regional standards varied significantly, both within and among drafts, with regard to quality of writing, outline format, level of detail, and comprehensiveness. In order to ensure consistency across the standards and to improve the level of scientific rigor, FSC-U.S. established a Standards Committee, whose task was to develop a set of national indicators. The National Indicators were approved by FSC-U.S. in January 2001 and serve as baseline standards for the further development and refinement of the regional standards. The National Indicators are designed to "harmonize" standards across the nine biogeographic regions of the conterminous 48 states. It is important to note that significant input from certifiers, based on their experience conducting assessments, was incorporated into the National Indicators, which helps ensure the auditability of the indicators.

For The Lake States Central Hardwood region, indicators 4.4.e, 5.6.a, 6.2.a, and criterion 6.4 are considered fatal flaws. This means failure to meet these indicators or criterion will preclude the issuance of a FSC certificate.

This draft of the Lake States Central Hardwoods Standards contains revisions that incorporate national baseline indicators from the National Indicators. In addition, the standards include region-specific indicators that address regional ecological, social, and economic conditions. This draft was finalized and approved by the Lakes States Working Group in January of 2002 after 4 years of work by the group and a 60-day public review period. All comments received during the public review period were considered by the working group and incorporated, as appropriate, into the final draft of the regional standards.

Concepts and requirements expressed in the FSC Principles and Criteria are included in the proposed Lakes States-Central Hardwoods Regional Certification Standards. Those Criteria are considered applicable standards, and during an assessment, certifiers are expected to evaluate the degree to which each Criterion is met in the same manner as they evaluate the regional indicators.

The National Indicators, approved by the FSC-U.S. Board as baseline standards for the development of all nine regional standards (see www.fscstandards.org) and the Lakes States-Central Hardwoods Regional Certification Standards, are considered by the U.S Standards Committee to exemplify sufficient scientific and technical rigor for application to assessments of private, municipal, county, tribal, and state lands conducted by accredited certifiers in the continental United States. This said, the Committee recognizes that additional indicators of performance may be required on Federally managed public lands because of their particular public mandates. To date, neither the National Indicators nor the Lake States-Central Hardwoods Regional Certification Standards apply to Federal lands, which means the Lakes States-Central Hardwoods Regional Certification Standards apply only to private and non-Federal public lands.

The working group will remain constituted for future revisions. The standards will be revised as necessary in response to new scientific information and/or changes in social-environmental circumstances. A review-and-revision process will be initiated no less than five years following approval by FSC-A.C. FSC-U.S. will maintain a regional working group coordinator in the Lake States-Central Hardwoods region.

Background

The Lake States Working Group of the FSC-U.S. Working Group was formed on November 11, 1998 at the Audubon Center of the North Woods in Sandstone, Minnesota. Working Group members represent landowners, forest managers, state and county agencies, sawmills, community interests, and environmental conservation interests. Members come from the Central Hardwoods sub-region and the Northwoods sub-region, from Kentucky, Ohio, Indiana, Illinois, Iowa, Wisconsin, Minnesota, and Michigan.

Lake States Working Group Membership:

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The Lake States-Central Hardwoods Region

Characterization of the Region can only be made in broad terms. To provide at least some focus, the Region is divided into Central Hardwoods (Kentucky, Ohio, Indiana, Illinois, Iowa) and Northwoods (Michigan, Wisconsin and Minnesota) sub-regions.

The Northwoods sub-region can be immediately divided into northern and southern sections. The upland forests of the northern section are characterized by potential dominance of shade-tolerant species (primarily sugar maple, red maple, American beech, basswood, and eastern hemlock) on mesic to dry mesic sites and by pines (jack, red, and eastern white), oaks (northern red, northern pin, and white) and aspen (trembling and bigtooth) on drier, nutrient-poorer sites. Presence of any of the conifer species in predominantly deciduous forest is another characteristic of the northern forest. There also are extensive lowland forests dominated by coniferous (balsam fir, northern white cedar, black spruce and tamarack) or deciduous species (black ash, red maple, balsam poplar).

The northern subsection is further characterized by an extensive cover of continuous forest with relatively little fragmentation while the southern section is dominated by relatively

small woodlots in an agricultural matrix. Historically, the predominant agent of natural disturbance was wind in the north and fire in the south.

The forest of the southern section is characterized by a predominance of oaks (primarily northern red, white, black, bur) and a general absence of conifers. Many oak communities are fire-dependent and, where seed sources exist, are now succeeding to shade tolerant species.

The Central Hardwoods sub-region can be divided into the glaciated area of northern Iowa, Illinois, Indiana, and Ohio and the unglaciated southern portion of these states plus Kentucky. The northern area has limited topographic relief and highly fragmented natural ecosystems due to past clearing for agriculture. Further, the western portion of the glaciated area, from Iowa to western Indiana, was historically a mixture of prairie and oak/hickory forest that was largely controlled by Native Americans through the use fire. The southern unglaciated area, on the other hand, has greater topographic relief and much greater forest cover than the northern area. The entire sub-region has been heavily disturbed by human activities, which means that most of the existing forest stands date from the late 1800s.

This sub-region has a great diversity of forest species that occur on sites ranging from dry to wet. A typical woodland has 20 to 30 species of commercially important trees. Due to past disturbances, most of the forests are currently dominated by seral species of oak and hickory with more tolerant species of maple and beech in the sub-canopy. Many of the remaining old stands are dominated by seral species, which probably reflect Native American activities that predate European occupation of the landscape.

Species composition varies with site conditions. In the north, the relatively flat topography generally has poor surface drainage so a typical woodland has such wet site species as bur oak, swamp white oak, green ash, and red maple in depressional areas. In contrast, better-drained soils in the same woodland have northern red oak, white oak, white ash, American elm, and sugar maple as major species. In the more hilly southern areas, the above species occur along with black oak, scarlet oak, and chestnut oak on drier upper slope positions while yellow poplar becomes much more abundant on the better sites of north facing slopes and in minor stream valleys. Major floodplains of the sub-region generally have flood tolerant species, such as eastern cottonwood and silver maple.

Coniferous species are of minor importance in this sub-region. Eastern red cedar and Virginia pine become more common in the southern areas. There are also a few relic stands of Northwoods species, such as eastern white pine and eastern hemlock. In addition, species of southern pine and eastern white pine have been widely planted to control erosion on disturbed lands.

Definition of Terms

Following are definitions of terms adopted for the purposes of these standards. Definitions of more technical terms are included in the Glossary.

Applicability Notes:
Applicability Notes are intended to clarify some indicators by defining their scope of application.

Forest Management Plan:
The document or documents that govern forest management planning over short and long terms.

Forest Owner or Manager:
Any person(s) who is (are) responsible for forest management decisions.

Indicator:
A regionally specific performance standard that is used by a certifier/assessor to determine if the intent of an FSC Principle or Criterion is being met on a regional level.

Regional Standards:
Statements of required actions or methods of adherence to the FSC guiding principles, specific to a particular biogeographic region. The adherence to regional standards by a forest owner or manager seeking certification must be addressed and evaluated by certifiers when they conduct assessments in that region. In addition to regional indicators, a set of regional standards may include verifiers, vision statements, explanatory notes, and a glossary.

Verifiers:
Non-binding examples of means or actions for meeting the requirements of indicators; qualitative or quantitative statements that aid forest owners or managers and certifiers in understanding the intent of indicators. Because of the wide variation in forest types and cultural values that can be found across a region, verifiers are considered important tools but are not, in and of themselves, confirmations of success or failure in meeting the intent of a regional indicator. In the Lakes States-Central Hardwoods Regional Certification Standards, all verifiers are identified by indentation and italics as in the example below.

Example of **draft** regional indicator and accompanying verifier:

> 6.6.c. Pesticides are applied as a management tool only in limited circumstances and under carefully controlled conditions.
>
> *For example:*
>
> - *There is no evidence of pesticide contamination in plant or animal populations, soils, or water as a result of forest activities.*

PRINCIPLE #1: COMPLIANCE WITH LAWS AND FSC PRINCIPLES

Forest management shall respect all applicable laws of the country in which they occur, and international treaties and agreements to which the country is a signatory, and comply with all FSC Principles and Criteria.

1.1. Forest management shall respect all national and local laws and administrative requirements.

1.1.a. Forest management plans and operations comply with applicable Federal, state, county, tribal, and municipal laws, rules, and regulations.

For example:

- *All necessary permits are obtained.*
- *There is neither evidence nor substantial claims of continued or intentional non-compliance with laws and regulations that relate to forest management by the forest owner or manager.*

1.1.b. Forest management plans and operations comply with state Best Management Practices (BMPs) (see Appendix for references) and other government forest management guidelines applicable to the forest, both voluntary and regulatory (see also Criterion 6.5).

For example:

- *Compliance with state, watershed, county, and planning district regulations.*

1.1.c. Forest management plans and operations meet or exceed all applicable laws and administrative requirements with respect to sharing public information, opening records to the public, and following procedures for public participation.

1.2. All applicable and legally prescribed fees, royalties, taxes and other charges shall be paid.

1.2.a. Taxes on forest land and timber, as well as other fees related to forest management, are paid in a timely manner and in accordance with state and local laws.

For example:

- *Tax receipts verify that property and excise taxes have been paid.*

1.3. In signatory countries, the provisions of all binding international agreements such as CITES, ILO Conventions, ITTA, and Convention on Biological Diversity, shall be respected.

1.3.a. Forest management operations comply with all binding treaties or other agreements to which the U.S. is a party, including treaties with American Indian tribes.

For example:

- *There is no evidence of non-compliance with relevant treaties and agreements.*

1.4. Conflicts between laws, regulations and the FSC Principles and Criteria shall be evaluated for the purposes of certification, on a case by case basis, by the certifiers and by the involved or affected parties.

1.4.a. Where conflicts between laws and FSC Principles and Criteria occur, they are referred to the appropriate FSC body.

1.5. Forest management areas should be protected from illegal harvesting, settlement and other unauthorized activities.

1.5.a. Forest owners or managers implement measures to prevent illegal and unauthorized activities in the forest.

For example:

- *The land manager paints and posts boundary notices, uses gates, makes periodic inspections, and reports illegal activities to the proper authorities.*

1.6. Forest managers shall demonstrate a long-term commitment to adhere to the FSC Principles and Criteria.

Note: The working group recognizes that pursuing certification and associated conditions demonstrates a commitment to adhere to FSC Principles and Criteria.

1.6.a. Forest owners or managers notify certifiers of changes in ownership and/or management planning.

For example:

- *A certified Resource Manager defines and identifies the certified land base, keeps records explaining the reasons clients leave the certified land base, and does not enroll "single-harvest-only" individual forest ownerships.*
- *Changes in ownership or significant changes in the management plan of individually (non-pooled) certified forests are reported to an FSC accredited certifier.*
- *Proposed changes in forest management activities or procedures that conflict with FSC regional standards are reviewed and resolved by the parties.*

PRINCIPLE #2: TENURE AND USE RIGHTS AND RESPONSIBILITIES

Long-term tenure and use rights to the land and forest resources shall be clearly defined, documented and legally established.

Applicability Note: Property rights of private landowners are respected. The forest owner or manager of privately owned land retain their private property rights, while simultaneously honoring the rights of adjacent landowners.

2.1. Clear evidence of long-term forest use rights to the land (e.g., land title, customary rights, or lease agreements) shall be demonstrated.

2.1.a. Forest owners or managers document the legal and customary rights associated with the forest. These rights include both those held by the party seeking certification and those held by other parties.

2.1.b. Affected land boundaries are clearly identified on the ground by the forest owner or manager prior to commencement of management activities.

2.2. Local communities with legal or customary tenure or use rights shall maintain control, to the extent necessary to protect their rights or resources, over forest operations unless they delegate control with free and informed consent to other agencies.

Applicability Note: For the planning and management of publicly owned forests, the local community is defined as all residents and property owners of the relevant jurisdiction.

2.2.a. The forest owner or manager allows legal and customary rights to the extent that they are consistent with the conservation of the forest resource and the objectives stated in the management plan.

For example:
- *Hiking, hunting, and fishing on non-posted property.*
- *Visiting ancestral gravesites.*

2.2.b. On ownerships where customary use rights or traditional and cultural areas/sites exist, forest owners or managers consult with concerned groups in the planning and implementation of forest management activities.

2.3. Appropriate mechanisms shall be employed to resolve disputes over tenure claims and use rights. The circumstances and status of any outstanding disputes will be explicitly considered in the certification evaluation. Disputes of substantial magnitude involving a significant number of interests will normally disqualify an operation from being certified.

2.3.a. The forest owner or manager maintains relations with community stakeholders to identify disputes while still in their early stages. If disputes arise, the forest owner or manager initially attempts to resolve them through open communication, negotiation, and/or mediation. If negotiation fails, existing local, state, Federal, and tribal laws are employed to resolve claims of land tenure (see Glossary).

2.3.b. The forest owner or manager provides information to the certification body regarding unresolved and/or ongoing disputes over tenure and use-rights. .

PRINCIPLE #3: INDIGENOUS PEOPLES' RIGHTS

The legal and customary rights of indigenous peoples to own, use and manage their lands, territories, and resources shall be recognized and respected.

Applicability Note: Under Principle 3, the terms "tribes," "tribal," or "American Indian groups" include all indigenous peoples in the U.S., groups or individuals, who may be organized in recognized or unrecognized tribes, bands, nations, native corporations, or other native groups.

3.1. Indigenous peoples shall control forest management on their lands and territories unless they delegate control with free and informed consent to other agencies.

3.1.a. On tribal lands, forest management and planning includes a process for input by tribal members in accordance with their laws and customs.

For example:
- *Forest owners or managers utilize tribal experience, knowledge, practices, and insights in forest management planning and operations on tribal lands when requested to do so by the tribal landowner.*

3.1.b. Forest management on tribal lands is delegated or implemented by an authorized tribal governing body.

For example:
- *A tribal body that is either elected or based on hereditary appointment authorizes the forest management operations.*
- *Documents verify the authority of the tribal body.*

3.2. Forest management shall not threaten or diminish, either directly or indirectly, the resources or tenure rights of indigenous peoples.

3.2.a. Forest owners or managers identify and contact American Indian groups that have customary use rights or other legal rights to the management area and invite their participation in the forest planning processes, appropriate to the scale and intensity of the operation. (see also Criterion 4.4.)

3.2.b. Steps are taken during the forest management planning process and implementation to protect tribal resources that may be directly affected by certified operations such as adjacent lands, bodies of water, critical habitats, and riparian corridors as well as other resource uses such as rights to hunt, fish, or gather.

3.3. Sites of special cultural, ecological, economic or religious significance to indigenous peoples shall be clearly identified in cooperation with such peoples, and recognized and protected by forest managers.

3.3.a. Forest owners or managers make systematic efforts to identify areas of cultural, historical, and/or religious significance. They invite participation of tribal representatives (or other appropriate persons, where tribal entities are lacking) in the identification of current or traditionally significant sites within the forest proposed for certification.

For example:

- *Such efforts include surveying, recording, assessment, establishment, and use of special use and protected areas when and where they are mandated by treaty rights.*
- *Forest owners or managers check existing heritage and cultural databases.*
- *Areas of cultural, historical, and religious significance as well as areas of traditional use, are documented by authorized tribal leaders or their designated representatives.*

For example, areas of special significance may include:

- *Ceremonial, burial, or village sites;*
- *Areas used for hunting, fishing, or trapping;*
- *Current gathering areas for culturally important or ceremonial materials, such as Basket materials, medicinal plants, or plants used in dances;*
- *Current gathering areas for subsistence uses, such as mushrooms, berries, acorns, etc.*

3.3.b. Forest owners and managers consult with tribal leaders (or other appropriate persons, where tribal entities are lacking) to develop mechanisms that ensure forest management operations protect from damage or interference those areas described in 3.3.a. and incorporate these special places into forest management and operational plans.

3.3.c. Confidentiality of disclosures is maintained in keeping with applicable laws and the requirements of tribal representatives.

3.4. Indigenous peoples shall be compensated for the application of their traditional knowledge regarding the use of forest species or management systems in forest operations. This compensation shall be formally agreed upon with their free and informed consent before forest operations commence.

3.4.a. Forest owners or managers respect the confidentiality of tribal knowledge and assist in the protection of tribal intellectual property rights.

For example:

- *When traditional ecological knowledge is requested for use in forest management, protocols are jointly developed with local tribes to protect the intellectual property rights of those tribes.*

3.4.b. A written agreement with individuals and/or tribes is reached prior to the commercialization of forest products based on rights of indigenous intellectual property.

PRINCIPLE #4: COMMUNITY RELATIONS AND WORKERS' RIGHTS

Forest management operations shall maintain or enhance the long-term social and economic well-being of forest workers and local communities.

4.1. The communities within, or adjacent to, the forest management area should be given opportunities for employment, training, and other services.

4.1.a. Opportunities for employment, contracting, procurement, processing, and training are as good for non-local service providers as they are for local service providers doing similar work.

For example:

- *Forest owners or managers give local goods and service providers an equal opportunity to bid on all contracts and services.*
- *Timber sales are offered in quantities and intervals that allow participation by local companies of all sizes.*
- *Forest owners or managers utilize qualified local employees and contractors.*

4.1.b. Forest work is packaged and offered in ways that create quality work opportunities for employees, contractors, and their workers.

For example, quality work can include, the following attributes:

- *Employee and contractor relationships that are long term and stable;*
- *A mixture of diverse tasks that require varying skill levels;*
- *Opportunities for employees to advance;*
- *A comprehensive package of benefits;*
- *Opportunities for employee and contractor participation in decision-making;*
- *Employment conditions (e.g., remuneration, benefits, safety equipment, training, and workman's compensation) are as good for non-local workers as they are for local workers doing the same job;*
- *Forest owners or managers provide and/or support training opportunities for workers to improve their skills.*

4.1.c. Forest owners or managers contribute to public education about forestry practices.

For example:

- *The forest is offered as a training and/or educational resource for local people in conjunction with schools, community colleges, and/or other providers of training and education.*

4.1.d. Forest owners or managers participate and invest in the local economy and civic activities.

For example:

- *Forest owners or managers participate in fund-raisers, field days, and local forestry committees.*
- *Facilities and equipment are regularly maintained and updated.*
- *Out-of-area owners maintain a local office.*
- *The forest owner or manager supports local business development by working with organizations, such as chambers of commerce.*

4.1.e. Employee compensation and hiring practices meet or exceed the prevailing local norms for work within the forest industry that requires equivalent education, skills, and experience.

4.1.f. Forest owners or managers assure that contractors, subcontractors, intermediaries, and persons hired by them are covered and protected by all state and Federal labor laws regarding discrimination, wages, benefits, and other conditions of employment.

For example:

- *Contracts contain clauses specific to legal coverage and protection.*
- *Owners and managers monitor compliance with laws.*
- *Employees are not discriminated against because of gender, race, religion, age, or disability.*

4.2. Forest management should meet or exceed all applicable laws and/or regulations covering health and safety of employees and their families.

4.2.a. The forest owner or manager and their contractors develop and implement safety programs and procedures.

For example:

- *Machinery and equipment are well-maintained and safe.*
- *Safety equipment appropriate to each task is used.*
- *Safety procedures are documented and posted in the workplace.*
- *Education in safety is offered (such as Forest Industry Safety Training Alliance and Game of Logging) .*
- *Contracts include safety requirements.*
- *For employees, safety records, training reports, and certificates are maintained.*

4.3 The rights of workers to organize and voluntarily negotiate with their employers shall be guaranteed as outlined in Conventions 87 and 98 of the International Labour Organization (ILO).

Applicability Note: This Criterion is guided by FSC guidelines on ILO Conventions (www.fscoax.org).

4.3.a. Forest workers are free to associate with other workers for the purpose of advocating for their own employment interests.

4.3.b. Forest owners or managers and their contractors develop effective and culturally sensitive mechanisms to resolve disputes between workers and management.

Examples of culturally sensitive mechanisms are:

- *Translation and cultural interpretation, when needed;*
- *Cross-cultural training, when needed, to integrate the workforce.*

4.4. Management planning and operations shall incorporate the results of evaluations of social impact. Consultations shall be maintained with people and groups directly affected by management operations.

Applicability Note: People and groups directly affected by management operations may include: employees and contractors of the landowner, neighbors, fishers, hunters and gatherers, recreationalists, water users, and forest products processors.

4.4.a. On lands with multiple owners, a process is provided that assures the opportunity for fair and reasonable input from the landowners and/or shareholders.

4.4.b. Input is sought in identifying significant sites of archeological, cultural, historical, or community importance, that are to be designated as special management zones or otherwise protected during operations.

For example:

- *State archeological offices, universities, and local experts have been consulted to identify known areas and develop protection plans.*

4.4.c. Viewpoints and feedback are solicited from people and groups directly affected by forest management operations and its associated environmental and aesthetic effects (e.g., logging, burning, spraying, and traffic). Significant concerns are addressed in management policies and plans.

4.4.d. Forest owners or managers of large and mid-sized (see Glossary) forests provide opportunities for people directly affected by management operations to provide input into management planning.

4.4.e. For public forests, consultation will include the following components:

Note: 'The public' includes people and groups directly affected by management operations and all citizens of the relevant jurisdiction.

Applicability Note: For the purposes of indicator 4.4.e each numbered component should be scored separately.

1. Legislative and historical mandates are included in the plan, and provisions are made for their accomplishment.

For example:

- *Legal mandates are carried out.*

2. Clearly defined and accessible methods for public participation are provided in both the strategic (long-range) and tactical (short-range) planning processes, including initial adoption and subsequent amendments.

Applicability Note: Strategic plans may be very general. Tactical plans are specific and describe candidate stands for proposed silvicultural activities.

For example:

- *Administrative rules or other documentation are provided for public input.*
- *Some routine activities with little or no environmental impact that appear unlikely to solicit input may be exempted from the procedures of public notification and comment. Examples of such activities include, but are not limited to:*
  - *1) Maintaining existing buildings or structures*
  - *2) Maintaining existing permanent roads or trails*
  - *3) Maintaining existing open-land areas (e.g., mowing grass)*
  - *4) Minor changes to tactical plans (e.g., small changes to areas affected)*
- *Public agencies solicit public input as early as practicable into the process.*

3. Public notification is sufficient to allow interested citizens of the affected jurisdiction and/or other people and groups directly affected by management operations the chance to learn of upcoming opportunities for public review and/or comment on the proposed management.

4. The final planning decisions are based on legal mandate, public input, credible scientific analysis, and the productive capacity of the land and are made by professional employees, hired by the public, or other legally authorized parties.

For example:

- *Evidence of how public comments are considered is provided.*

5. An accessible and affordable appeals process to planning decisions is available.

Note: FSC certification does not preclude any individual or group from seeking legislative or judicial relief.

4.5. Appropriate mechanisms shall be employed for resolving grievances and for providing fair compensation in the case of loss or damage affecting the legal or customary rights, property, resources, or livelihoods of local peoples. Measures shall be taken to avoid such loss or damage.

Applicability Note: Provisions of Criterion 4.5. do not evoke protections or liabilities beyond those provided by Federal, state, and local laws.

4.5.a. The forest owner or manager attempts to resolve grievances and mitigate damage resulting from forest management activities through open communication and negotiation prior to legal action.

4.5.b. Forest owners or managers and their contractors have adequate liability insurance.

PRINCIPLE #5: BENEFITS FROM THE FOREST

Forest management operations shall encourage the efficient use of the forest's multiple products and services to ensure economic viability and a wide range of environmental and social benefits.

5.1. Forest management should strive toward economic viability, while taking into account the full environmental, social, and operational costs of production, and ensuring the investments necessary to maintain the ecological productivity of the forest.

5.1.a. The forest owner or manager is willing and able to support long-term forest management (i.e., decades rather than quarter-years or years), such as planning, inventory, resource protection, and post-harvest management activities.

5.1.b. Responses (such as increases in harvests or debt load) to short-term financial factors (such as market fluctuations and sawmill supply requirements) are limited to levels that enable fulfillment of the management plan.

5.1.c. Investment and/or reinvestment in forest management are sufficient to fulfill management objectives and maintain and/or restore forest health and productivity.

For example:

- *Investments have been made in forest stand improvement activities and information systems.*
- *Forest conditions confirm that investments are adequate.*

5.2. Forest management and marketing operations should encourage the optimal use and local processing of the forest's diversity of products.

5.2.a. Opportunities are given to local, financially competitive, value-added processing and manufacturing facilities.

For example:

- *The technical and financial specifications of some sales of forest products are scaled to allow successful competition by small businesses.*

5.2.b. When non-timber products are harvested, the management and use of those products is incorporated into the management plan.

5.2.c. New markets are explored for products from common but underutilized forest species.

5.3. Forest management should minimize waste associated with harvesting and on-site processing operations and avoid damage to other forest resources.

5.3.a. Adequate quantities and a diversity of size classes of woody debris (considered a reinvestment of biological capital under this criterion—not an economic waste) are left on the forest floor to maintain ecosystem functions, wildlife habitats, and future forest productivity.

5.3.b. The loss and/or waste of merchantable forest products is minimized.

For example:

- *Harvested products are handled to minimize potential loss in value.*
- *Waste from on-site processing facilities (e.g., portable sawmills) is minimized and used as an input into a productive process.*

5.3.c. Harvest practices minimize residual stand damage.

For example:

- *Soil compaction, rutting, and erosion are minimized.*
- *Provisions that define acceptable levels of residual damage are included in operational contracts.*
- *Low-impact logging techniques are used.*
- *Non-timber forest products are protected from damage by management activities.*
- *Bumper trees are utilized and equipment is selected and used in a way that minimizes unintentional damage to residual trees.*

5.4. Forest management should strive to strengthen and diversify the local economy, avoiding dependence on a single forest product.

5.4.a. Forest management diversifies forest uses and products, while maintaining forest composition, structures, and functions.

For example:

- *Compatible uses may include recreation, ecotourism, hunting, fishing, and specialty products.*

5.5. Forest management operations shall recognize, maintain, and, where appropriate, enhance the value of forest services and resources such as watersheds and fisheries.

The Working Group considers that this criterion is sufficiently explicit and measurable, so does not require indicators.

5.6. The rate of harvest of forest products shall not exceed levels that can be permanently sustained.

5.6.a. The sustainability of harvest levels is based on growth and regeneration data, site index models, soil classification, and/or desired future conditions. The required level of documentation is determined by the scale and intensity of the operation.

For example:

- *Stocking rates, growth rates, and removal volumes conform to projections of the long-term written management plan.*

- *The age-class distribution (see Glossary) required for a sustainable-yield volume is justified by data.*

5.6.b. After the species composition and the age-class (see Glossary) distribution commensurate with long-term sustainability have been achieved, harvest and growth records demonstrate that the volume harvested during any 10-year span is less than the net growth accumulated over that same period. Exceptions to this constraint may be granted to forest owners or managers whose periodic cycle of re-entry is longer than 10 years. In such cases, allowable harvest is determined by examining the volume of re-growth and removal since the previous harvest and the forest owner or manager's commitment to allow an equivalent amount of re-growth before additional harvests.

For example:

- *Rapid growth rates in younger forests are not used as the sole justification for the harvest of slower-growing, older forests.*

5.6.c. If rates of harvest are temporarily accelerated to compensate for or prevent unacceptable mortality, or in cases of salvage operations (see Indicator 6.3.c.4), the rate of future harvest is recalculated accordingly to meet desired future conditions, and the adjusted rate of harvest is implemented within three years of the temporary acceleration.

PRINCIPLE #6: ENVIRONMENTAL IMPACT

Forest management shall conserve biological diversity and its associated values, water resources, soils, and unique and fragile ecosystems and landscapes, and, by so doing, maintain the ecological functions and the integrity of the forest.

6.1. Assessments of environmental impacts shall be completed -- appropriate to the scale, intensity of forest management and the uniqueness of the affected resources -- and adequately integrated into management systems. Assessments shall include landscape level considerations as well as the impacts of on-site processing facilities. Environmental impacts shall be assessed prior to commencement of site-disturbing operations.

Applicability Note: Small forest owners or managers who practice low intensity forestry may meet this requirement with brief, informal assessments. More extensive and detailed assessments (e.g., formal assessments by scientists) are expected by large forest owners or managers and/or those who practice more intensive forestry management (see Glossary).

6.1.a. Using credible scientific analyses and local expertise, an assessment of current conditions is completed to include:

- Disturbance regimes and successional pathways;
- Unique, vulnerable, rare, and threatened communities;
- Common plants, animals, and their habitats;
- Sensitive, threatened, and endangered species and their habitats;
- Water resources; and

- Soil resources (see also Indicators 7.1.a and b).

6.1.b. Using available science and local expertise, the current ecological conditions are compared to both the historical conditions and desired future conditions within the landscape context. This comparison is done by employing the baseline factors identified in 6.1.a.

6.1.c. Prior to the commencement of management activities, potential short-term environmental impacts and their cumulative effects are evaluated.

6.1.d. Using assessments derived from the above information, management options are developed and implemented to achieve the long-term desired future conditions and ecological functions of the forest (see also Criterion 7.1).

6.2. Safeguards shall exist which protect rare, threatened and endangered species and their habitats (e.g., nesting and feeding areas). Conservation zones and protection areas shall be established, appropriate to the scale and intensity of forest management and the uniqueness of the affected resources. Inappropriate hunting, fishing, trapping, and collecting shall be controlled.

6.2.a. Although species that are state and/or Federally listed as threatened, endangered, of special concern, or sensitive, and their habitats are identified, their specific locations remain confidential.

Note: On public forests and large private forests, the general locations of state and/or Federally listed as threatened, endangered, of special concern, or sensitive species are made available to the public.

For example:

- *The forest owner or manager has contacted the state natural heritage program (or its equivalent) to obtain a list of listed species and their habitat or community type to document their presence or potential presence.*
- *An on-the-ground survey for listed species has been conducted.*
- *The locations of such species are mapped.*
- *Management plans provide descriptions of activities appropriate for maintaining such species' habitat(s).*
- *Management activities are compatible with endangered species recovery plans and/or habitat conservation plans.*
- *Evidence of communication and/or collaboration with relevant experts is demonstrated.*
- *The forest owner or manager participates in programs to protect listed species.*
- *Forestry staff receives training in the identification of listed species and their habitat requirements.*

6.2.b. If scientific data indicate the likely presence of state and/or Federally listed as threatened, endangered, of special concern, or sensitive populations, either new surveys are carried out before field-management activities begin or the forest owner or manager assumes their presence and makes appropriate modifications in forest management.

6.2.c. For management planning purposes, forest owners or managers of publicly owned and large privately owned forests use, participate in, or carry out on-the-ground assessments for the

occurrence of state and/or Federally listed as threatened, endangered, of special concern, or sensitive species.

For example:

- *The forest owner or manager uses an appropriate survey for listed species.*

6.2.d. Where they have been identified, state and/or Federally listed as threatened, endangered, of special concern, or sensitive species and their habitats are maintained and/or restored. Multiple-use management activities are acceptable, where the law allows, in these species' habitat areas to the extent that they are compatible with maintenance and restoration of the species.

For example:

- *Within the context of existing landscape and ownership patterns, conservation zones for listed species and other protected areas are arranged to enhance the viability of habitats, including their connectivity.*

6.2.e. If a state and/or Federally listed as threatened, endangered, of special concern, or sensitive species is determined to be present, its location is reported to the manager of the species' database.

6.3. Ecological functions and values shall be maintained intact, enhanced, or restored, including:

a) Forest regeneration and succession.
b) Genetic, species, and ecosystem diversity.
c) Natural cycles that affect the productivity of the forest ecosystem.

6.3.a. Forest regeneration and succession

Applicability Note: Indicators 6.3.a.1. through 6.3.a.4. are intended to be applied sequentially.

6.3.a.1. Forest owners or managers make management decisions using credible scientific information (e.g., site classification) and information on landscape patterns (e.g., land use/land cover, non-forest uses, habitat types); ecological characteristics of adjacent forested stands (e.g., age, productivity, health); species' requirements; and frequency, distribution, and intensity of natural disturbances.

Applicability Note: This indicator may apply only marginally to managers of small and mid-sized forest properties because of their limited ability to coordinate their activities with other owners within the landscape or to significantly maintain and/or improve landscape-scale vegetative patterns.

6.3.a.2. Silvicultural practices encourage regeneration that moves the forest toward a desired future condition, consistent with information gathered in 6.3.a.1.

For example:

- *Native species suited to the site are selected for regeneration.*
- *Within five years of a regeneration harvest, adequate regeneration exists to move the stand toward desired future conditions. Exceptions are noted and documented.*

Note: Development of a forest that is capable of natural regeneration, based on desired future conditions, is encouraged.

6.3.a.3. Measures are taken to ensure the retention of endemic and difficult-to-regenerate species.

For example:

- *Deer populations are controlled to enhance successful regeneration.*

6.3.a.4. Across the forest, or the landscape in which it is located, management actions lead to a distribution of successional stages, age classes, and community types appropriate to the scale and intensity of the operation and desired future conditions.

For example:

- *Large forests are managed so that large, contiguous, and interconnected patches of habitat are well distributed across the landscape, in such a way as to allow dispersal of species sensitive to fragmentation.*
- *Within a context of liability and public safety, large forests and public forests are managed to allow the occurrence of natural components, structures, and disturbance regimes.*

6.3.a.5. When even-aged management (see Glossary) is employed, live trees and native vegetation are retained within the harvest unit in a proportion and configuration that is consistent with the characteristic natural disturbance regime in each community type (see Glossary). Exceptions may be allowed when retention at a lower level is necessary for purposes of forest restoration and/or rehabilitation or to maintain community types that exist on the site (e.g., oak-hickory, jack pine). The level of retention increases proportionally to the size of the harvest unit.

6.3.b. Genetic, species, and ecosystem diversity

6.3.b.1. Forest management conserves native plant and animal communities and species.

For example:

- *Declining trees and snags (see Glossary) are left in the forest.*
- *Vertical and horizontal structural complexity is maintained.*
- *Diversity of understory species is maintained.*
- *Well-distributed, large woody debris is maintained.*
- *Habitats and refugia for sedentary species and those with narrow or special habitat requirements are created and/or maintained.*
- *Artificial regeneration uses locally adapted seed and seedlings.*

6.3.b.2. The forest owner or manager cooperates with local, state, and Federal agencies to protect and manage native plant and animal communities and species.

6.3.b.3. There is a consistent scientific method for selecting trees to plant, harvest and retain in order to preserve and/or enhance broad genetic and species diversity.

For example:

- *Phenotypic diversity is maintained, in accordance with desired future conditions.*

6.3.b.4. Forest owners or managers maximize habitat connectivity to the extent possible at the landscape level (e.g., through an ecological classification system, at the subsection or land-type association level).

For example, habitat connectivity is enhanced by:

- *Creating habitat corridors and protecting riparian management zones (RMZs) (see Glossary) between habitats;*
- *Changes in harvest-patch block (see Glossary) sizes, harvest patterns, and land use changes to create connectivity among existing patched of habitat;.*
- *Restoration plantings specifically to increase connectivity among existing patches of habitat.*

6.3.c. Natural cycles that affect the productivity of the forest ecosystem

6.3.c.1. Biological legacies of the forest community are retained at the forest and stand levels, consistent with the objectives of the management plan, including but not limited to: large live and declining trees, coarse dead wood, logs, snags, den trees, and soil organic matter.

6.3.c.2. Forest management practices maintain soil fertility and organic matter, especially in the A horizon, while minimizing soil erosion and compaction. If degradation of soil quality occurs, as indicated by declining fertility or forest health, forest owners or managers modify soil management techniques.

For example:

- *Primary management objectives shift from commercial production to restoration.*
- *Site preparation is minimized.*
- *Road system design and construction is upgraded.*
- *The lightest practical equipment with the lowest ground pressure is used.*
- *Whole-tree harvesting is discontinued, and tops are left in the forest.*
- *Longer rotations and a diversity of species are used in lieu of artificial fertilization.*
- *Processes of natural early succession are allowed or encouraged.*

6.3.c.3. Forest management practices maintain or restore aquatic ecosystems, wetlands (including peatlands, bogs, and vernal pools), and forested riparian areas (see also Criterion 6.5).

6.3.c.4. Responses (such as salvage) to catastrophic events (such as wildfire, blowdown, and epidemics) are limited by ecological constraints.

For example:

- *Adequate coarse woody debris is maintained.*
- *Adequate den trees and snags are maintained.*
- *Endemic levels of 'pest' populations are allowed before pest control actions are carried out.*

6.4. Representative samples of existing ecosystems within the landscape shall be protected in their natural state and recorded on maps, appropriate to the scale and intensity of operations and the uniqueness of the affected resources.

Applicability Note: When forest management activities (including timber harvest) create and maintain conditions that emulate an intact, mature forest or other successional phases that may be under-represented in the landscape, the management system that created those conditions may be used to maintain them, and the area may be considered as a representative sample for the purposes of meeting this criterion.

A system of ecologically viable representative samples is designated to serve one or more of three purposes: (1) to establish and/or maintain an ecological reference condition, (2) to create or maintain an under-represented ecological condition (e.g., successional phases of a forest type or plant community, see Glossary), or (3) to protect a feature that is sensitive, rare, or unique in the landscape. Areas serving the purposes of (1) and (2) may move across the landscape as under-represented conditions change, or may be fixed in area and manipulated to maintain the desired conditions. Areas serving the purposes of (3) are fixed in location.

Forests of all sizes may be conducive to protection of fixed features, such as rock outcrops and bogs. Medium-sized and large forests may be more conducive to the maintenance of successional phases and disturbance patterns than small forests.

The goal of Criterion 6.4 is to achieve a system of protected representative samples of existing ecosystems within the landscape. This may be accomplished by the establishment of a system of protected areas within a single ownership, or through a combination of ownerships (certified or not) across the landscape.

In light of their size, location, or statutory mandates, public forests and large private forests may bear a special obligation to provide for a system of representative samples of native ecosystems.

Representative samples may be protected solely by the conditions of the certificate and/or through the use of conservation easements or other instruments of long-term protection.

6.4.a. Where existing protected areas within the landscape are not of a size and configuration to serve the purposes listed in the above Applicability Note, forest owners or managers, whose properties are conducive to the establishment of such ecologically viable areas, designate them. The size, extent, and arrangement of on-site and off-site (i.e., on and off of the certified forest) representative sample areas are designated, documented, and justified.

For example:

- *Management plans address the spatial relationships between or among representative samples, protected areas, and managed areas and may include gap analysis.*

- *Forest owners or managers collaborate with state natural heritage programs; public agencies; regional, landscape, and watershed planning efforts; universities; and other entities to identify representative sample areas.*

6.4.b. Large private and public forest owners or managers use or carry out an analysis to evaluate the extent to which representative samples of existing ecosystems are adequately protected in the landscape. The size and extent of representative samples on public lands are determined through a management planning process that includes public input (see also Indicator 4.4.e).

6.4.c. The process and rationale used to determine the size and extent of representative samples are described in the public summary of the certificate.

6.4.d. Where areas are under-represented in which natural disturbance may occur unconstrained, large, contiguous public forests (see Glossary) create and maintain representative system of protected areas to accommodate such acts of nature.

6.5. Written guidelines shall be prepared and implemented to control erosion; minimize forest damage during harvesting, road construction, and all other mechanical disturbances; and to protect water resources.

Note: The Lakes States-Central Hardwoods Regional Certification Standards cover a diverse landscape - from prairie to glaciated Northern lands to unglaciated forests in the South. Within this region, all States have developed best management practice guidelines specific to their ecological conditions (see Appendix A). These locally developed guidelines serve as the base requirement for implementation of this standard.

6.5.a. A set of forestry best management practices (BMPs), approved by the state forestry agency or otherwise appropriate jurisdiction (e.g., BIA), that address water quality and soil erosion is adhered to (see also 1.1.b). These guidelines may include provisions on riparian management zones (RMZs), skidding, access roads, site preparation, log landings, stream crossings, disturbance of sensitive sites, and wetlands.

6.5.b. At a minimum, implementation of BMPs and other resource protection measures will result in the following:

Logging and Site Preparation

Logging operations and construction of roads and skid trails are conducted only during periods of weather when soil is least susceptible to compaction, surface erosion, or sediment transport into streams and other bodies of water.

For example:

- *Operations are carried out when soils are either dry enough or frozen enough to minimize disturbance and compaction.*
- *Vehicular access to roads is controlled to limit soil erosion and other forest damage.*

Logging damage to regeneration and residual trees is minimized during harvest operations.

Silvicultural techniques and logging equipment vary with slope, erosion hazard rating, and/or soil instability with the goal of minimizing soil disturbance. Areas that exhibit an extreme risk of landslide are excluded from management activities that may precipitate landslides.

Note: "Extreme risk" is a legally binding term in some states.

Plans for site preparation specify the following mitigations to minimize impacts to the forest resources:

(1) Slash is concentrated only as much as necessary to achieve the goals of site preparation and the reduction of fuels to moderate or low levels of fire hazard.

(2) Top soil disturbance and scarification of soils is limited to the minimum necessary to achieve successful regeneration of desired species.

- **Transportation System (including permanent and temporary haul roads, skid trails, and landings)**

The transportation system is designed, constructed, maintained, and/or reconstructed to minimize the extent of the road network and its potential cumulative adverse effects.

For example:

- *Road density is minimized.*
- *Displacement of soil and the sedimentation of streams, as well as impacts to water quality, are minimized.*
- *Patches of habitat and migration corridors are conserved as much as possible.*
- *The integrity of riparian management zones (see Glossary) and buffers (see Glossary) surrounding other valuable ecological elements (e.g., wetlands, habitat for sensitive species, and interior old-growth forest) is conserved.*

Access to temporary and permanent roads is controlled to minimize significant adverse impacts to soil and biota while allowing legitimate access, as addressed by Principles 3 and 4 and identified in the management plan.

For example:

- *Roads without a weather resistant surface (e.g., soil, dirt, or native-surfaced roads) are used only during periods of weather when conditions are favorable to minimize road damage, surface erosion, and sediment transport.*
- *Vehicle access is restricted on roads not immediately necessary for management purposes.*

Failed drainage structures or other areas of active erosion caused by roads and skid trails are identified, and measures are taken to correct the drainage problems and stabilize erosion.

- **Stream and Water Quality Protection**

  Stream crossings are located and constructed in a way that minimizes fragmentation of aquatic habitat (see Glossary) and protects water quality.

  For example:
  - *Crossings of riparian management zones are kept to a minimum.*
  - *Stream crossings are perpendicular to the waterway.*
  - *Culverts allow free passage of aquatic organisms.*

- **Visual and Aesthetic Considerations**

  Forest owners or managers limit and/or reduce negative impacts on visual quality caused by forest management operations.

6.6. Management systems shall promote the development and adoption of environmentally friendly non-chemical methods of pest management and strive to avoid the use of chemical pesticides. World Health Organization Type 1A and 1B and chlorinated hydrocarbon pesticides; pesticides that are persistent, toxic or whose derivatives remain biologically active and accumulate in the food chain beyond their intended use; as well as any pesticides banned by international agreement, shall be prohibited. If chemicals are used, proper equipment and training shall be provided to minimize health and environmental risks.

Applicability Note: This Criterion is guided by FSC guidelines on chemical use (www.fscoax.org or www.fscus.org).

6.6.a. Forest owners or managers implement integrated pest management and rely on methods that are the most environmentally compatible within a context of economic viability and social acceptability.

6.6.b. Silvicultural systems and prescriptions are used to lower natural susceptibility and vulnerability of stands to insect and disease outbreaks.

For example:
- *Species diversity and healthy stand structures enhance natural predators and reduce the potential need for pesticides.*

6.6.c. Pesticides are applied as a management tool only in limited circumstances and under controlled conditions.

For example:
- *Assessment of pesticide use is based on the frequency and written rationale of pesticide use, the extent to which silvicultural methods minimize the need for pesticides, and the effectiveness of use - i.e., the targeting accuracy of application, and appropriateness of timing.*

6.6.d. Forest owners or managers develop written pest control strategies as a component of the management plan. (see also Criterion 7.1)

6.6.e. A written prescription, which includes a discussion of precautions and potential environmental effects, is prepared for each pesticide that is used. Records are kept of pest occurrences, control measures, and incidences of worker exposure to chemicals.

For example:

- *Label instructions are followed.*

6.7. Chemicals, containers, liquid and solid non-organic wastes including fuel and oil shall be disposed of in an environmentally appropriate manner at off-site locations.

6.7.a. In the event of a spill of hazardous material, forest owners or managers immediately contain the material, report the spill as required by applicable regulations, and engage qualified personnel to perform the appropriate removal and remediation.

6.7.b. Waste lubricants, anti-freeze, containers, and related trash are stored in a leakproof container until they are transported to an approved off-site disposal site.

For example:

- *Management operations incorporate resource recycling and reuse programs when they are available.*

6.7.c. Broken or leaking equipment and parts are repaired or removed from the forest.

6.7.d. Equipment is parked away from riparian management zones, sinkholes, or supplies of ground water.

6.8. Use of biological control agents shall be documented, minimized, monitored, and strictly controlled in accordance with national laws and internationally accepted scientific protocols. Use of genetically modified organisms shall be prohibited.

Applicability Note: Genetically improved organisms (e.g., Mendelian crossed) are not considered to be genetically modified organisms (see Glossary), and may be used. The prohibition of genetically modified organisms applies to all organisms, including trees. This Criterion is guided by FSC guidelines on GMO's (www.fscoax.org).

6.8.a. Exotic (i.e., non-indigenous), non-invasive predators or biological control agents are used only as part of a pest management strategy for the control of exotic species of plants, pathogens (see Glossary), insects, or other animals when other pest control methods are, or can reasonably be expected to prove, ineffective. Such use is contingent upon peer-reviewed scientific evidence that the agents in question are non-invasive and are safe for indigenous species because, for example, exotic species can host pathogens that might diminish biodiversity in the forest.

6.9. The use of exotic species shall be carefully controlled and actively monitored to avoid adverse ecological impacts.

6.9.a. Except on plantation sites (see also Criterion 10.4), the use of exotic tree species is permitted only in the first successional stages or other short-term stages for the purposes of restoring degraded ecosystems.

6.9.b. The use of exotic species (see Glossary) is contingent on peer-reviewed scientific evidence that the species in question is non-invasive and will not diminish biodiversity. If non-invasive exotic species are used, the provenance and location of use are documented, and their ecological effects are actively monitored.

For example:

- *Non-invasive exotic plants that are sown to control erosion are used only when suitable native species are not readily available.*

6.9.c. Written documentation is maintained for the use of exotic species.

For example:

- *Species mixes, rates, locations, and times of application are all recorded.*

6.9.d. Forest owners or managers develop and implement control measures for invasive exotic species.

6.10. Forest conversion to plantations or non-forest land uses shall not occur, except in circumstances where conversion:

a) Entails a very limited portion of the forest management unit; and
b) Does not occur on High Conservation Value Forest areas; and
c) Will enable clear, substantial, additional, secure, long-term conservation benefits across the forest management unit.

Applicability Note: Forest management activities that are part of an approved management plan, including road construction and habitat restoration (such as creation of openings in the forest for wildlife habitat and the maintenance or creation of wetlands or prairies) are not conversions for the purposes of this criterion.

6.10.a. Over the life of the ownership, forest to non-forest conversions are limited to the threshold of 1% of the forest area or 100 acres, whichever is smaller, except that a parcel up to two acres in size may be converted for residential use by the forest owner or manager.

6.10.b. When private forest lands are sold, a portion of the proceeds of the sale is reinvested in additional forest lands and/or forest stewardship.

PRINCIPLE #7: MANAGEMENT PLAN

A management plan -- appropriate to the scale and intensity of the operations -- shall be written, implemented, and kept up to date. The long-term objectives of management, and the means of achieving them, shall be clearly stated.

7.1. The management plan and supporting documents shall provide:

- **a) Management objectives.**
- **b) Description of the forest resources to be managed, environmental limitations, land use and ownership status, socio-economic conditions, and a profile of adjacent lands.**
- **c) Description of silvicultural and/or other management system, based on the ecology of the forest in question and information gathered through resource inventories.**
- **d) Rationale for rate of annual harvest and species selection.**
- **e) Provisions for monitoring of forest growth and dynamics.**
- **f) Environmental safeguards based on environmental assessments.**
- **g) Plans for the identification and protection of rare, threatened and endangered species.**
- **h) Maps describing the forest resource base including protected areas, planned management activities and land ownership.**
- **i) Description and justification of harvesting techniques and equipment to be used.**

Applicability Note: The management plan may consist of a variety of documents not necessarily unified into a single planning document but which represents an integrated strategy for managing the forest within the ecological, economic, and social limitations of the land. The plan includes a description and rationale for management elements appropriate to the scale, intensity, and goals of management, and may include:

Silvicultural systems
- Regeneration strategies
- Maintenance of structural and species diversity
- Pest control (disease, insects, invasive species, and vegetation)
- Soil and water conservation
- Methods and annual rates of harvest, by species and products
- Equipment and personnel needs

Transportation system

Fire management
- Prescribed fires
- Wildfires

Fish and wildlife and their habitats (including non-game species)

Non-timber forest products

Methods and annual rates of harvest, by species and products
Regeneration strategies
Socioeconomic issues
Public access and use
Conservation of historical and cultural resources
Protection of aesthetic values
Employee and contractor policies and procedures
Community relations
Stakeholder notification
Public comment process
For public forests, legal and historic mandates
American Indian issues
Protection of legal and customary rights
Procedures for integrating tribal concerns in forest management
Management of sites of special significance
Special management areas
High Conservation Value Forests
Riparian management zone
Set asides of samples of representative existing ecosystems
Sensitive, rare, threatened, and endangered species protection
Other protected areas
Landscape level analyses and strategies

7.1.a. Management objectives

7.1.a.1. A written management plan is prepared that includes the landowner's short-term and long-term goals and objectives (ecological, social, and economic). The objectives are specific, achievable, and measurable.

7.1.a.2. The management plan describes desired future conditions that will meet the long-term goals and objectives and that determine the silvicultural system(s) and management activities to be used.

For example:

- *The management plan includes a description of forest resources to be managed, environmental limitations, the status of land use and ownership, socioeconomic conditions, and a profile of adjacent lands.*
- *See 7.1.b.1, 7.1.b.2, 7.1.b.3, 7.1.b.4, 7.1.b.5, and 7.1.b.6 for additional examples*

7.1.b. Description of forest resources to be managed, environmental limitations, land use and ownership status, socioeconomic conditions, and profile of adjacent lands

7.1.b.1. The management plan describes the timber, fish and wildlife, harvested non-timber forest products, soils, and non-economic forest resources.

7.1.b.2. The management plan includes descriptions of special management areas; sensitive, rare, threatened, and endangered species and their habitats; and other ecologically sensitive features in the forest.

7.1.b.3. The management plan includes a description of past land uses and incorporates this information into the vision, goals, and objectives.

7.1.b.4. The management plan identifies the legal status of the forest and its resources (e.g., ownership, usufruct rights (see Glossary), treaty rights, easements, deed restrictions, and leasing arrangements).

7.1.b.5. The management plan identifies relevant cultural and socioeconomic issues (e.g., traditional and customary rights of use, access, recreational uses, and employment), conditions (e.g., composition of the workforce, stability of employment, and changes in forest ownership and tenure), and areas of special significance (e.g., ceremonial and archeological sites).

7.1.b.6. The management plan incorporates landscape-level considerations within the ownership and among adjacent and nearby lands, including major bodies of water, critical habitats, and riparian corridors shared with adjacent ownerships.

7.1.c. Description of silvicultural and/or other management system

7.1.c.1. Silvicultural system(s) and prescriptions are based on the integration of ecological and economic characteristics (e.g., successional processes, soil characteristics, existing species composition and structures, desired future conditions, and market conditions). (see also sub-Criterion 6.3.a)

7.1.c.2. Prescriptions are prepared prior to harvesting, site preparation, pest control, burning, and planting and are available to people who implement the prescriptions.

7.1.d. Rationale for the rate of annual harvest and species selection

7.1.d.1. Calculations for the harvests of both timber and non-timber products are detailed or referenced in the management plan and are based on net growth, yield, stocking, and regeneration data. (see also 5.6.b)

7.1.d.2. Species selection meets the social and economic goals and objectives of the forest owner or manager and leads to the desired future conditions while maintaining or improving the ecological composition, structures, and functions of the forest.

7.1.d.3. The management plan addresses potentially disruptive effects of pests, storms, droughts, and fires as they relate to allowable cut.

7.1.e. Provisions for monitoring forest growth and dynamics (see also Principle 8)

7.1.e.1. The management plan includes a description of procedures to monitor the forest.

7.1.f. Environmental safeguards based on environmental assessments (see also Criterion 6.1.)

7.1.g. Plans for the identification and protection of rare, threatened, and endangered species. (see also Criterion 6.3.)

7.1.h. Maps describing the forest resource base including protected areas, planned management activities, and land ownership.

7.1.h.1. The management plan includes maps of such forest characteristics as: relevant landscape-level factors; property boundaries; roads; areas of timber production; forest types by age class; topography; soils; riparian zones; springs and wetlands; archaeological sites; areas of cultural and customary use; locations of sensitive, rare, threatened, and/or endangered species and their habitats; and designated High Conservation Value Forests.

7.1.i. Description and justification of harvesting techniques and equipment to be used. (see also Criterion 6.5)

7.1.i.1. Harvesting machinery and techniques are discussed in the management or harvest plan and are specifically matched to forest conditions in order to minimize damage.

7.1.i.2. Conditions for each timber sale are established by a timber sale contract or written harvest prescription and accompanying timber sale map.

For example:

- *Timber sale contracts and harvest prescriptions provide detailed specifications of how trees are to be harvested.*

7.2. The management plan shall be periodically revised to incorporate the results of monitoring or new scientific and technical information, as well as to respond to changing environmental, social and economic circumstances.

7.2.a. Operational components of the management plan are reviewed and revised as necessary or at least every 5 years. Components of the long-term (strategic) management plan are revised and updated at the end of the planning period or when other changes in the management require it. (see also Criterion 8.4)

For example:

- *The rationale for changes in the management plan is stated in subsequent revisions.*
- *Relevant provisions of the management plan are modified in response to such changes as fire, market conditions, or damage to the road system.*

7.3. Forest workers shall receive adequate training and supervision to ensure proper implementation of the management plans.

7.3.a. The forest owner or manager assures that workers are qualified to implement the management plan (see also Criterion 4.2).

For example:

- *Loggers and other operators participate in informal and formal training, such as Forest Industry Safety Training Alliance, Game of Logging.*
- *Professional foresters and resource managers meet continuing education standards, such as the Society of American Foresters "Certified Forester" program.*
- *The forest owner or manager utilizes directories that either list or are based on worker qualifications.*

7.3.b. The management plan is understandable, comprehensive, and readily available to field personnel.

7.4. While respecting the confidentiality of information, forest managers shall make publicly available a summary of the primary elements of the management plan, including those listed in Criterion 7.1.

Applicability Note: Forest owners or managers of private forests may withhold proprietary information (e.g., the nature and extent of their forest resource base, marketing strategies, and other financial information). (see also Criterion 8.5)

7.4.a. A management plan summary that outlines management objectives (from sub-Criterion 7.1.a.), whether on private lands or the land pool under a resource manager, is available to the public at a reasonable fee. Additional elements of the plan may be excluded, to protect the security of environmentally sensitive and/or proprietary information.

7.4.b. Managers of public forests make forestry-related information easily accessible (e.g., available on websites) for public review, including that required by Criterion 7.1.

PRINCIPLE #8: MONITORING AND ASSESSMENT

Monitoring shall be conducted -- appropriate to the scale and intensity of forest management -- to assess the condition of the forest, yields of forest products, chain of custody, management activities and their social and environmental impacts.

Applicability Note: On small and medium-sized forests (see Glossary), an informal, qualitative assessment may be appropriate. Formal, quantitative monitoring is required on large forests and/or intensively managed forests.

8.1. The frequency and intensity of monitoring should be determined by the scale and intensity of forest management operations, as well as, the relative complexity and fragility of the affected environment. Monitoring procedures should be consistent and replicable over time to allow comparison of results and assessment of change.

8.1.a. The frequency of monitoring activities follows the schedule outlined in the management plan.

8.1.b. Monitoring is carried out to assess:

- The degree to which management goals and objectives have been achieved;
- Deviations from the management plan;
- Unexpected effects of management activities;
- Social (see Criterion 4.4) and environmental (see Criterion 6.1) effects of management activities.

8.1.c. Public and large, private land owners or managers take the lead in identifying, initiating, and supporting research efforts to address pertinent ecological questions. Small and medium private land owners or managers use information that has been developed by researchers and other managers.

8.2. Forest management should include the research and data collection needed to monitor, at a minimum, the following indicators:

a) Yield of all forest products harvested.
b) Growth rates, regeneration and condition of the forest.
c) Composition and observed changes in the flora and fauna.
d) Environmental and social impacts of harvesting and other operations
e) Cost, productivity, and efficiency of forest management

8.2.a. Yield of all forest products harvested

8.2.a.1. The forest owner or manager maintains records of standing inventories of timber and harvest volumes of timber and non-timber species (quality and quantity).

For example:

- *Significant unanticipated removal of forest products (e.g., theft and poaching) is monitored and recorded.*

8.2.b. Growth rates, regeneration, and condition of the forest

8.2.b.1. An inventory system is established and records are maintained for:

(1) Timber growth and mortality (for volume control systems);
(2) Stocking, and regeneration;
(3) Stand-level and forest-level composition and structure (e.g., by use of tools, such as ecological classification systems);
(4) Abundance, regeneration, and habitat conditions of non-timber forest products;
(5) Terrestrial and aquatic features;
(6) Soil characteristics (e.g., texture, drainage, existing erosion);
(7) Pest conditions.

8.2.c. Composition and observed changes in the flora and fauna

8.2.c.1. Forest owners or managers periodically monitor the forest for changes in major habitat elements and in the occurrence of sensitive, rare, threatened, or endangered species or communities.

8.2.d. Environmental and social impacts of harvesting and other operations

8.2.d.1. The environmental effects of site-disturbing activities are assessed (e.g., road construction and repair, harvesting, and site preparation).

For example:

- *Monitoring for compliance with Best Management Practices is carried out.*
- *A monitoring program is in place to assess the condition and environmental impact of the road system and landings.*

8.2.d.2. Creation or maintenance of local jobs and public responses to management activities are monitored.

8.2.d.3. Sites of special significance to American Indians are monitored in consultation with tribal representatives (see also Principle 3).

8.2.e. Cost, productivity, and efficiency of forest management

8.2.e.1. Forest owners or managers monitor the cost and revenues of management in order to assess productivity and efficiency.

8.3. Documentation shall be provided by the forest manager to enable monitoring and certifying organizations to trace each forest product from its origin, a process known as the "chain of custody."

Applicability Note: For chain-of-custody management requirements, see Section 3.6 of Chain of Custody Standards, FSC Accreditation Manual.

8.4. The results of monitoring shall be incorporated into the implementation and revision of the management plan.

8.4.a. Discrepancies between the results of management activities or natural events (i.e. yields, growth, ecological changes) and expectations (i.e. plans, forecasts, anticipated impacts) are appraised and taken into account in the subsequent management plan.

8.5. While respecting the confidentiality of information, forest managers shall make publicly available a summary of the results of monitoring indicators, including those listed in Criterion 8.2.

Applicability Note: Forest owners or managers of private forests may withhold proprietary information (e.g., the nature and extent of their forest resource base, marketing strategies, and other financial information). (see also Criterion 7.4)

8.5.a. A summary outlining the results of monitoring is available to the public at a reasonable fee, whether on private lands or a land pool under a resource manager or group certification.

8.5.b. Managers of public forests make information related to monitoring easily accessible (e.g., available on websites) for public review.

PRINCIPLE #9: MAINTENANCE OF HIGH CONSERVATION VALUE FORESTS

Management activities in high conservation value forests shall maintain or enhance the attributes which define such forests. Decisions regarding high conservation value forests shall always be considered in the context of a precautionary approach.

High Conservation Value Forests are those that possess one or more of the following attributes:

- **a) Forest areas containing globally, regionally or nationally significant: concentrations of biodiversity values (e.g., endemism, endangered species, refugia); and/or large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance**
- **b) Forest areas that are in or contain rare, threatened or endangered ecosystems**
- **c) Forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control)**
- **d) Forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health) and/or critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).**

Examples of forest areas that *may have* high conservation value attributes include, but are not limited to:

Central Hardwoods:

- Old growth – (see Glossary) (a)
- Old forests/mixed age stands that include trees >160 years old (a)
- Municiple watersheds –headwaters, reservoirs (c)
- Rare, Threatened, and Endangered (RTE) ecosystems, as defined by GAP analysis, Natural Heritage Inventory, and/or the World Wildlife Fund's Forest Communities of Highest Conservation Concern, and/or Great Lakes Assessment (b)
- Intact forest blocks in an agriculturally dominated landscape (refugia) (a)
- Intact forests >1000 ac (valuable to interior forest species) (a)
- Protected caves (a, b, or d)
- Savannas (a, b, c, or d)
- Glades (a, b, or d)
- Barrens (a, b, or d)
- Prairie remnants (a, b, or d)

North Woods/Lake States:

- Old growth – (see Glossary) (a)
- Old forests/mixed age stands that include trees >120 years old (a)
- Blocks of contiguous forest, > 500 ac, which host RTEs (b)
- Oak savannas (b)
- Hemlock-dominated forests (b)
- Pine stands of natural origin (b)
- Contiguous blocks, >500 ac, of late successional species, that are managed to create old growth (a)
- Fens, particularly calcareous fens (c)
- Other non-forest communities, e.g., barrens, prairies, distinctive geological land forms, vernal pools (b or c)
- Other sites as defined by GAP analysis, Natural Heritage Inventory, and/or the World Wildlife Fund's Forest Communities of Highest Conservation Concern (b)

Note: In the Lake States-Central Hardwoods region, old growth (see Glossary) is both rare and invariably an HCVF.

In the Lake States-Central Hardwoods region, cutting timber is not permitted in old-growth stands or forests.

Note: Old forests (see Glossary) may or may not be designated HCVFs. They are managed to maintain or recruit: (1) the existing abundance of old trees and (2) the landscape- and stand-level

structures of old-growth forests, consistent with the composition and structures produced by natural processes.

Old forests that either have or are developing old-growth attributes, but which have been previously harvested, may be designated HCVFs and may be harvested under special plans that account for the ecological attributes that make it an HCVF.

Forest management maintains a mix of sub-climax and climax old-forest conditions in the landscape.

9.1. Assessment to determine the presence of the attributes consistent with High Conservation Value Forests will be completed, appropriate to scale and intensity of forest management.

Applicability Note: Certain information may be withheld from public discussion to protect the attributes that may be of High Conservation Value. The level of delineation and consultations required is dependent on the scale and intensity of the operation.

9.1.a. Attributes and locations of High Conservation Value Forests are determined by:

(1) Globally rare, threatened, or endangered features, habitats, or ecosystems that may be present in the forest (suggested sources of information are: The Nature Conservancy, World Wildlife Fund, Conservation International, World Resources Institute);
(2) Regionally and locally rare, threatened, or endangered features, habitats, or ecosystems that may be present in the forest; culturally and tribally significant areas; or municipal watersheds that may be present in the landscape and/or certified forest (suggested sources of information include natural and cultural heritage agencies);
(3) Appropriate consultations with local and regional scientists and other stakeholders;
(4) Public review of proposed HCVF attributes and areas on large-scale and public ownerships (see also 7.4, 4.4.e., 4.4.f.);
(5) Integration of information from consultations and public review into proposed HCVF delineation;
(6) Delineation by maps and habitat descriptions.

9.2. The consultative portion of the certification process must place emphasis on the identified conservation attributes, and options for the maintenance thereof.

Note: FSC understands that Criterion 9.2 is an instruction to Certification Bodies and that no indicators are required.

9.3. The management plan shall include and implement specific measures that ensure the maintenance and/or enhancement of the applicable conservation attributes consistent with the precautionary approach. These measures shall be specifically included in the publicly available management plan summary.

Applicability Note: The applicability of the precautionary principle (see Glossary) and the consequent flexibility of forest management vary with the size, configuration, and tenure of the HCVF:

a) More flexibility is appropriate where an HCV forest is less intact, larger in area, has a larger area-to-perimeter ratio, and its tenure is assured over the long term.

b) Less flexibility is appropriate where an HCV forest is more intact, covers a smaller area, has a smaller area-to-perimeter ratio, and future tenure is uncertain, based on social considerations.

9.3.a. Forest management plans and activities are appropriate for maintaining, enhancing and/or restoring attributes that make the area an HCVF.

For example:

- *Passive management activities are carried out when they maintain, enhance, or restore HCVF characteristics and/or enlarge the size of the HCVF.*
- *When prescribed burns, removal of invasive species, and integrated pest management activities are carried out, they occur in a manner consistent with maintenance, protection and/or restoration of HCVF characteristics.*
- *When timber harvesting is carried out, it occurs in a manner that is consistent with HCVF maintenance, enhancement, or restoration.*

9.3.b. Active management in HCVFs is allowed only when it maintains or enhances high conservation values.

For example:

- *Maintenance of old-growth and HCVF attributes may be carried out by: (1) removal of exotic species and (2) use of controlled burning.*

9.3.c. The management-plan summary includes information about HCVF management without compromising either the confidentiality of the forest owner or manager or environmentally and culturally sensitive features (see also sub-Criterion 7.1.f).

9.3.d. Forest owners or managers of HCVFs (forests and/or stands) coordinate conservation efforts with forest owners or managers of other HCVFs in the landscape.

9.4. Annual monitoring shall be conducted to assess the effectiveness of the measures employed to maintain or enhance the applicable conservation attributes.

9.4.a. Forest owners or managers of small forests may satisfy this requirement with informal observations (see 8.1 and 8.2.). When observations detect changes, the changes are documented.

9.4.b. Forest owners or managers of mid-sized and large forests monitor activities within and adjacent to HCVFs that may affect HCVF attributes (see Criteria 7.2, 8.1 and 8.2). Monitoring is adequate to track changes in HCV attributes, and may include informal observations. When monitoring detects changes to HCV attributes, the changes are documented.

PRINCIPLE # 10: PLANTATIONS

Plantations shall be planned and managed in accordance with Principles and Criteria 1 - 9, and Principle 10 and its Criteria. While plantations can provide an array of social and economic benefits, and can contribute to satisfying the world's needs for forest products, they should complement the management of, reduce pressures on, and promote the restoration and conservation of natural forests.

Applicability note: Plantations are forest areas lacking most of the principal characteristics and key elements of native ecosystems, as a result of such human activities as planting, sowing, or intensive silvicultural treatments like short-term rotations and short-term coppice systems (see Glossary)(see Criterion 6.9 for use of exotics).

Planting, seeding, and coppicing do not necessarily result in plantations.
Non-forest land being afforested becomes a plantation or a managed natural forest based on the owner's goals and objectives for the land in question as well as the development of its attributes.

10.1. The management objectives of the plantation, including natural forest conservation and restoration objectives, shall be explicitly stated in the management plan, and clearly demonstrated in the implementation of the plan.

Note: The Working Group considers that this criterion is sufficiently explicit and measurable, so does not require indicators.

10.2. The design and layout of plantations should promote the protection, restoration and conservation of natural forests, and not increase pressures on natural forests. Wildlife corridors, streamside zones and a mosaic of stands of different ages and rotation periods shall be used in the layout of the plantation, consistent with the scale of the operation. The scale and layout of plantation blocks shall be consistent with the patterns of forest stands found within the natural landscape.

10.2.a. Plantation layout minimizes soil degradation and erosion and protects soil and water quality by accounting for slope, aspect, erodibility, and movement of surface water (see also Criterion 6.5).

10.2.b. Plantations are managed and integrated into the surrounding landscape in order to improve natural habitats.

For example:

- *Plans for and methods of habitat restoration are determined by the spatial patterns of the forest, as well as by other relevant ecological factors in the landscape.*
- *Landowners or managers collaborate with other landowners or managers in the landscape.*

10.2.c. For plantation harvests larger than forty acres lacking within-stand retention, the size of the opening is justified by credible scientific analysis.

10.2.d. Plantations may be re-established on existing plantation sites (see also Criterion 10.5.a.), provided they are consistent with the management plan. They may be established on agricultural lands in historically forested areas (see also Criterion 6.10).

10.2.e. Regeneration in previously harvested areas reaches a mean height of at least ten feet or achieves canopy closure (see Glossary) before adjacent areas are harvested, unless an earlier harvest can be justified by credible scientific analysis. Forest buffers between harvest units are arranged to allow contiguous populations of native species.

For Example:

- *An earlier harvest may be justified in specific habitats on the basis of wildlife management considerations.*

10.3. Diversity in the composition of plantations is preferred, so as to enhance economic, ecological and social stability. Such diversity may include the size and spatial distribution of management units within the landscape, number and genetic composition of species, age classes and structures.

10.3.a. Forests containing plantations are managed to create and maintain structural and species diversity that results in viable wildlife habitat and long-term soil maintenance and replenishment.

10.3.b. Plantation-management activities are planned to generate and maintain long-term employment.

10.4. The selection of species for planting shall be based on their overall suitability for the site and their appropriateness to the management objectives. In order to enhance the conservation of biological diversity, native species are preferred over exotic species in the establishment of plantations and the restoration of degraded ecosystems. Exotic species, which shall be used only when their performance is greater than that of native species, shall be carefully monitored to detect unusual mortality, disease, or insect outbreaks and adverse ecological impacts.

Applicability Note: See FSC guidelines regarding Criterion 6.8 for use of GMO's and see Criterion 6.9 for allowable use of exotic species.

10.4.a. The use of exotic plant species (see Glossary) is contingent on peer-reviewed scientific evidence that the species in question is neither invasive nor a threat to the indigenous biodiversity. If non-invasive exotic species of plants are used, their provenance and location of use are documented, and their ecological effects are actively monitored.

10.4.b. The genetic composition of plantations is suitable for local conditions and is managed for

diversity to avoid infestations of pests.

10.5. A proportion of the overall forest management area, appropriate to the scale of the plantation, shall be managed so as to restore the site to a natural forest cover.

10.5.a. The ratio of plantations to natural and semi-natural forests (see Glossary), as well as their spatial distribution, maintains and/or restores the landscape to a condition that includes a diversity of community types, wildlife habitats, and ecological functions similar to a mosaic of native forests.

10.5.b. On land converted from non-forest uses to forest plantation uses, a percentage of the total area owned in the landscape is maintained as and/or restored to natural and semi-natural forest cover. The minimum percentage plantation area that is maintained in semi-natural or natural forest is:

- for 100 acres or less, at least 10 percent.
- for 101 to 1,000 acres, at least 15 percent.
- for 1,001 to 10,000 acres, at least 20 percent.
- for > 10,000 acres, at least 25 percent.

10.5.c. On currently forested land, up to 30% of the area may be managed as plantations (see Glossary). This percentage is reduced to 15% over a 50-year period.

10.5.d. Areas of forest and/or plantation to be restored to natural and semi-natural conditions are chosen through a landscape analysis that focuses on enhancing ecological integrity and habitat connectivity.

For example:

- *Areas that are best suited for such restoration include riparian areas, migration corridors between areas of existing natural forest, and unstable slopes.*

10.6. Measures shall be taken to maintain or improve soil structure, fertility, and biological activity. The techniques and rate of harvesting, road and trail construction and maintenance, and the choice of species shall not result in long term soil degradation or adverse impacts on water quality, quantity or substantial deviation from stream course drainage patterns.

Note: The Working Group considers that this criterion is sufficiently explicit and measurable, so does not require indicators.

10.7. Measures shall be taken to prevent and minimize outbreaks of pests, diseases, fire and invasive plant introductions. Integrated pest management shall form an essential part of the management plan, with primary reliance on prevention and biological control methods rather than chemical pesticides and fertilizers. Plantation management should make every effort to move away from chemical pesticides and fertilizers, including their

use in nurseries. The use of chemicals is also covered in Criteria 6.6 and 6.7.

Note: The Working Group considers that this criterion is sufficiently explicit and measurable, so does not require indicators.

10.8. Appropriate to the scale and diversity of the operation, monitoring of plantations shall include regular assessment of potential on-site and off-site ecological and social impacts, (e.g., natural regeneration, effects on water resources and soil fertility, and impacts on local welfare and social well-being), in addition to those elements addressed in Principles 8, 6 and 4. No species should be planted on a large scale until local trials and/or experience have shown that they are ecologically well-adapted to the site, are not invasive, and do not have significant negative ecological impacts on other ecosystems. Special attention will be paid to social issues of land acquisition for plantations, especially the protection of local rights of ownership, use or access.

Note: The Working Group considers that this criterion is sufficiently explicit and measurable, so does not require indicators.

10.9. Plantations established in areas converted from natural forests after November 1994 normally shall not qualify for certification. Certification may be allowed in circumstances where sufficient evidence is submitted to the certification body that the manager/owner is not responsible directly or indirectly of such conversion.

Note: The Working Group considers that this criterion is sufficiently explicit and measurable, so does not require indicators.

GLOSSARY

Terms Specific to Lake States Central-Hardwood Regional Certification Standards

Age class: Intervals (commonly 10 years) into which the age range of a tree crop is divided; also the trees falling into such an interval.

Allottee(s): Person(s) holding an Indian allotment on a property. An Indian allotment is private land owned by one or more individuals (rather than a tribe) but held in trust by the federal government.

Aquatic habitat: Habitat that occurs in free, available water (as opposed to water that is unavailable for habitat).

Buffer: A strip of vegetation that is left or managed to reduce the impact of a treatment or action in one area on another.

Canopy: The more or less continuous cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth.

Canopy closure: The progressive reduction of space among tree crowns as they spread laterally.

Community: A group of one or more populations of plants and/or animals in a common spatial arrangement; an ecological term used in a broad sense to include groups of various sizes and degrees of integration.

Community type: A generalized category comprising a number of similar units or stands of vegetation that also include animals.

Configuration: The shape or outline of a forest stand or plant community; the degree of irregularity in the edge among forest stands or communities; varying from simple to mosaic.

Cumulative impact: The sum of impacts resulting from forest management, in a time frame as far into the past as data and information allow.

Endangered species: A species officially designated by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service as having its continued existence threatened over all or a significant portion of its range because its habitat is threatened with destruction, drastic modification, or severe curtailment or because of overexploitation, disease, predation, or other factors.

Erosion: The displacement of soil from one place to another by any means, such as water, wind, gravity, logging, and road building.

Even-aged management: A system of forest management in which stands are produced or maintained with relatively minor differences in age.

Exotic plant species: For the purpose of these standards, exotic species of plants are those that meet one of the two following definitions:
1) They do not occur naturally in temperate or sub-tropical North America, *or*
2) They occur naturally in temperate or sub-tropical North America, but come from a forest category that is different from the certified forest. (Kuchler, A.W. 1975. Potential natural vegetation of the conterminous United States (map). Second edition. American Geographical Society. New York. [Scale: 1:3,168,000])

Kuchler has divided the nation's forests into six categories: Eastern needle leaf, broad leaf, and mixed forests; and Western needle leaf, broad leaf, and mixed forests. Needle-leaf trees with a native range in eastern forest may be planted in eastern needle-leaf and mixed forests. Broad-leaf trees with a native range in eastern forests may be planted in eastern broad-leaf and mixed forests. Needle-leaf trees with a native range in western forests may be planted in western-needle leaf and mixed forests. Broad-leaf trees with a native range in western forests may be planted in western broad-leaf and mixed forests.

Forest: (A) The property or portions of a property that is under certificate or being assessed for certification; the corresponding FSC International nomenclature is "Defined Forest Area." (B) Generally, an ecosystem characterized by tree cover; more particularly, a plant community predominantly of trees and other woody vegetation that is growing closely together.

Harvest block: A forest stand or part of a stand that is managed as a single unit for on-the-ground (e.g., thinning, harvest, planting) purposes.

Integrity: The state of being unimpaired; soundness; completeness; unity.

Intensive forestry: The practice of forestry to obtain a high level of volume of wood products per unit of area; accomplished through the application of the best techniques of silviculture and management.

Large forest: A forest that is at least 50,000 acres in size.

Managed forest: A forest that is managed to accomplish specified objectives.

Mid-Sized Forest: A forest between 5,000 and 50,000 acres in size.

Nutrient cycling: The circulation of elements, such as nitrogen and carbon, via specific pathways from abiotic to biotic portions of the environment and back again; all mineral and nutrient cycles involving humans, animals, and plants—such as the carbon cycle, phosphorous cycle, and nitrogen cycle.

Old forest: Forests that demonstrate old-growth characteristics but which have been previously harvested.

Old-growth: A stand or forest that demonstrates old-growth characteristics and is unroaded or lightly roaded, with no evidence of previous logging.

Pathogen: Any agent that causes disease, especially microorganisms, such as bacteria or fungi.

Plant community: A vegetative complex unique in its combination of plants; occurs in particular locations under particular influences; a reflection or integration of the environmental influences on the site, such as soils, temperature, elevation, solar radiation, slope, aspect, and rainfall; denotes a general kind of climax vegetation, such as white pine, hemlock, or hard maple, from which several plant community types may be derived on the basis of characteristic lesser vegetation.

Public land: Any land, including public forestland, held in government ownership in trust for the citizens of a city, county, state, or nation.

Refugium: A small island of habitat in which a species can survive and from which it can disperse when the surrounding habitat becomes suitable for it to live in.

Restoration: The process of modifying a habitat or ecosystem to introduce or reintroduce composition, structures, and functions that are native to the site.

Riparian zone: An area identified by the presence of vegetation that requires free or unbound water or conditions more moist than normally found in the area.

Scientific analysis: Credible scientific analyses is defined as scientific opinions supported by data and explanations in articles published in peer-reviewed natural or social science professional journals, and which has been discussed by the U.S. Standards Committee (USSC) and judged to be relevant to the matter in question. When necessary to gain clarity and perspective, the USSC will consult with scientists, forestry specialists, FSC members, and other stakeholders. Scientific credibility, as it applies to this criterion, is thus based on a body of scientific work and on the judgment of experienced professionals.

Sediment: Material suspended in liquid or air; the deposition of that material onto a surface underlying this liquid or air.

Semi-natural forest: A forest ecosystem containing many of the characteristics of native ecosystems. Semi-natural forests exhibit a history of human disturbance (e.g., harvesting or other silvicultural activities) and make up a considerable percentage of the managed and unmanaged forestland in the Lake States-Central Hardwoods region.

Silviculture: The art of producing and tending a forest by manipulating its establishment, composition, and growth to best fulfill the objectives of the owner. This may, or may not, include timber production.

Short rotation coppice systems: Harvest systems that are typically perpetuated long-term in which only a few characteristics of an indigenous ecosystem remain.

Slope: The incline of the land surface measured in degrees from the horizontal or in a percent as determined by the number of units of change in elevation per 100 of the same measurement units; also characterized by the compass direction in which it faces.

Small forest: A forest up to 5,000 acres in size.

Snag: A standing dead tree from which the leaves and most of the limbs have fallen.

Soil: Earth material so modified by physical, chemical, and biological agents that it will support rooted plants (American Geological Institute 1962).

Species: A unit of classification of plants and animals that consists of the largest and most inclusive array of sexually reproducing and cross-fertilizing individuals that share a common gene pool; the most inclusive Mendelian population.

Species composition: The species that occur on a site or in a successional or vegetative stage of a plant community.

Stand: Plant communities, particularly of trees, sufficiently uniform in composition, constitution, age, spatial arrangement, or condition so as to be distinguished from adjacent communities; also may delineate a silvicultural or management entity.

Structural diversity: The diversity in a plant community resulting from the variety of physical forms of the plants within the community (such as the layering or tiering of the canopy of a forest from the ground-level to the tops of the tallest trees).

Tenure: Socially defined agreements held by individuals or groups, recognized by legal statutes or customary practice, regarding the "bundle of rights and duties" of ownership,

holding, access, and/or usage of a particular land unit or the associated resources therein (such as individual trees, plant species, water, minerals, etc).

Threatened species: Any species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Use rights: Rights for the use of forest resources that can be defined by local custom, mutual agreements, or prescribed by other entities holding access rights. These rights may restrict the use of particular resources to specific levels of consumption or particular harvesting techniques.

Usufruct: The right to use property not owned by the user, with the proviso that the condition or quality is not degraded by its use

Water quality: The quality of water determined by a series of standard parameters including: turbidity, temperature, bacterial count, pH, and dissolved oxygen.

Woody debris: All woody material, from whatever source, that is dead and lying on the forest floor.

Terms as defined in FSC International Principles and Criteria

Biological diversity: The variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are a part; this includes diversity within species, between species and of ecosystems. (see Convention on Biological Diversity, 1992)

Biological diversity values: The intrinsic, ecological, genetic, social, economic, scientific, educational, cultural, recreational and aesthetic values of biological diversity and its components. (see Convention on Biological Diversity, 1992)

Biological control agents: Living organisms used to eliminate or regulate the population of other living organisms.

Chain of custody: The channel through which products are distributed from their origin in the forest to their end-use.

Chemicals: The range of fertilizers, insecticides, fungicides, and hormones, which are used in forest management.

Criterion (pl. Criteria): A means of judging whether or not a Principle (of forest stewardship) has been fulfilled.

Customary rights: Rights, which result from a long series of habitual or customary actions, constantly repeated, which, have, by such repetition and by uninterrupted acquiescence, acquired the force of a law within a geographical or sociological unit.

Ecosystem: A community of all plants and animals and their physical environment, functioning together as an interdependent unit.

Endangered species: Any species that is in danger of extinction throughout all or a significant portion of its range.

Exotic species: An introduced species not native or endemic to the area in question.

Forest integrity: The composition, dynamics, functions and structural attributes of a natural forest.

Forest management/manager: The people responsible for the operational management of the forest resource and of the enterprise, as well as the management system and structure, and the planning and field operations.

Genetically modified organisms: Biological organisms which have been induced by various means to consist of genetic structural changes.

High Conservation Value Forests: High Conservation Value Forests are those that possess one or more of the following attributes:
a) forest areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g., endemism, endangered species, refugia); and/or large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance
b) forest areas that are in or contain rare, threatened or endangered ecosystems
c) forest areas that provide basic services of nature in critical situations (e.g., watershed protection, erosion control)
d) forest areas fundamental to meeting basic needs of local communities (e.g., subsistence, health) and/or critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities).

Indigenous lands and territories: The total environment of the lands, air, water, sea, sea-ice, flora and fauna, and other resources which indigenous peoples have traditionally owned or otherwise occupied or used. (Draft Declaration of the Rights of Indigenous Peoples: Part VI)

Indigenous peoples: "The existing descendants of the peoples who inhabited the present territory of a country wholly or partially at the time when persons of a different culture or ethnic origin arrived there from other parts of the world, overcame them and, by conquest, settlement, or other means reduced them to a non-dominant or colonial situation; who today live more in conformity with their particular social, economic and cultural customs and traditions than with the institutions of the country of which they now form a part, under State structure which incorporates mainly the national, social and cultural characteristics of other segments of the population which are predominant." (Working definition adopted by the UN Working Group on Indigenous Peoples).

Landscape: A geographical mosaic composed of interacting ecosystems resulting from the influence of geological, topographical, soil, climatic, biotic and human interactions in a given area.

Local laws: Includes all legal norms given by organisms of government whose jurisdiction is less than the national level, such as departmental, municipal and customary norms.

Long term: The time-scale of the forest owner or manager as manifested by the objectives of the management plan, the rate of harvesting, and the commitment to maintain permanent forest cover. The length of time involved will vary according to the context and ecological

conditions, and will be a function of how long it takes a given ecosystem to recover its natural structure and composition following harvesting or disturbance, or to produce mature or primary conditions.

Native species: A species that occurs naturally in the region; endemic to the area.

Natural cycles: Nutrient and mineral cycling as a result of interactions between soils, water, plants, and animals in forest environments that affect the ecological productivity of a given site.

Natural forest: Forest areas where many of the principal characteristics and key elements of native ecosystems such as complexity, structure and diversity are present, as defined by FSC approved national and regional standards of forest management.

Non-timber forest products: All forest products except timber, including other materials obtained from trees such as resins and leaves, as well as any other plant and animal products.

Other forest types: Forest areas that do not fit the criteria for plantation or natural forests and which are defined more specifically by FSC-approved national and regional standards of forest stewardship.

Plantation: Forest areas lacking most of the principal characteristics and key elements of native ecosystems as defined by FSC-approved national and regional standards of forest stewardship, which result from the human activities of either planting, sowing or intensive silvicultural treatments.

Precautionary approach: Tool for the implementation of the precautionary principle.

Precautionary principle: Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation. (1992 Rio Declaration on Environment and Development)

Principle: An essential rule or element; in FSC's case, of forest stewardship.

Silviculture: The art and science of producing and tending a forest by manipulating its establishment, composition and growth to best fulfill the objectives of the owner. This may, or may not, include timber production.

Succession: Progressive changes in species composition and forest community structure caused by natural processes (non-human) over time.

Tenure: Socially defined agreements held by individuals or groups, recognized by legal statutes or customary practice, regarding the "bundle of rights and duties" of ownership,

holding, access and/or usage of a particular land unit or the associated resources there within (such as individual trees, plant species, water, minerals, etc).

Threatened species: Any species, which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Use rights: Rights for the use of forest resources that can be defined by local custom, mutual agreements, or prescribed by other entities holding access rights. These rights may restrict the use of particular resources to specific levels of consumption or particular harvesting techniques.

APPENDIX A. REFERENCES

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